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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/643,692

08/18/2003

Seiji Hidaka

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Richard LaCava
DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP
41st Floor
1177 Avenue of the Americas
New York, NY 10036-2714

EXAMINER

SUMMONS, BARBARA

ART UNIT

PAPER NUMBER

2817

DATE MAILED: 10/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/643,692

Applicant(s)

HIDAKA ET AL.

Examiner

Barbara Summons

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 8/18/03 (Pre-Amendment).
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3-5, 8 and 11-16 is/are rejected.
- 7) ☒ Claim(s) 2, 6, 7, 9 and 10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 8/18/03 & 1/2/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Acknowledgment is made of applicants' claim for foreign priority under 35 U.S.C. § 119(a)-(d) based upon an application filed in Japan on 18 December 2001. A claim for priority under 35 U.S.C. § 119(a)-(d) cannot be based on said application, since the United States application was filed more than twelve months thereafter. It should be noted that the instant application was not filed under 35 USC § 371, so that the National Stage rules do not apply. Nothing has been received (i.e. no copies of any priority docs.) from the International Bureau to indicate that this is a National Stage Application under 35 USC § 371.

Claim Objections

2. Claims 1, 7, 9, 15 and 16 are objected to because of the following informalities:

In claim 1, on line 4, note that "ends" should be changed to the singular - -end- - (i.e. end portions).

In claim 7, on line 3, it appears that "dept" should be - -depth- - (see claim 6).

In claim 9, on line 3, note that "layer" should be changed to the plural - -layers- -.

In claim 15, on line 3, for better grammar, "said one of conductor lines" should be changed to - -said one conductor line- -.

Similarly, in claim 16, on lines 2-3, "said one of conductor lines" should be changed to - -said one conductor line- -.

Appropriate correction is required.

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Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1, 3, 5, 8 and 11-16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Zhang et al. U.S. 6,122,533 in view of Ye U.S. 5,922,650.

Before beginning the rejection, it should be noted that "ring-shaped" will be treated broadly such as a loop that is not particularly circular (see Applicants' Fig. 1) and also treated as a more narrow circular shape.

Regarding claims 1, 11 and 16, Figs. 1A and 1B of Zhang et al. disclose a filter with a resonator 14a comprising a "ring-shaped" resonant element including one conductor line having: an input/output means 18 coupled thereto; a capacitive part, being formed by locating the end portions 26 and 28 of the same conductor line such that they closely adjoin/overlap each other and have a particular gap distance 30 in a

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width direction (see col. 5, lines 25-31); and an inductive part (being the remainder of the line part 27). Regarding claim 3, the resonator is formed on a plane-shaped substrate 12. Regarding claim 5, see Fig. 4, which alternately forms the resonator capacitive part by having the ends of the conductor line 50 closely adjoin in interdigital transducer fashion 54. Regarding claim 13, the filter of Figs. 1A and 1B is disclosed for use in a communication apparatus (see col. 1, line 63 to col. 2, line 4).

However, Zhang et al. does not disclose: (1) a single resonator comprising a "plurality of" resonant elements with capacitive parts in close proximity as required by claims 1 and 15; (2) a space between conductor lines in a width direction being "substantially constant" as required by claim 8; and (3) does not explicitly disclose a "duplexer" in a "communication apparatus" as required by claims 12 and 14.

Furthermore, Zhang et al. does not show circular ring resonators.

Regarding items (1) and (2) and also claim 16, Ye discloses forming a hairpin shaped resonator (see col. 4, lines 52-60 and Fig. 14) with a plurality of resonant element conductor lines (see Fig. 1 vs. Fig. 4) with the conductor lines being spaced apart by gaps 34 that have a particular constant gap distance S (see col. 3, lines 18-19).

Consequently, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the single conductor line resonator/filter of Zhang et al. (Figs. 1A and 1B) such that each resonator 14 single conductor line would have been replaced by a plurality of resonant elements each formed of one conductor line (i.e. such that the resonator 14a would have been changed to look similar to Applicants' Fig. 3) with the multiple capacitive parts in close proximity separated by a

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particular gap distance S such as taught, for example, by Ye (Fig. 4 and col. 4, lines 52-60 and Fig. 14), because such an obvious modification would have provided the advantageous benefit of reduced current density at the edges of the resonator so as to increase the power handling capability thereof, as suggested by Ye (see col. 1, lines 47-54 and 62-66), and because Ye explicitly suggested doing so in resonators (col. 4, lines 52-60).

It would have been further obvious to one of ordinary skill in the art at the time the invention was made to have used the filter of Zhang/Ye in a duplexer communication apparatus, because Zhang specifically suggests that an intended use of its filter is in a PCS mobile handset which one of ordinary skill would have known included a duplexer to separate transmit/receive frequencies.

Additionally, if one is to consider "ring-shaped" to be circular, then it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the resonator of Zhang/Ye to have been circular rather than hairpin/oval shaped because such an obvious modification would have been the mere substitution or art recognized equivalent resonator shapes (see other prior art of record cited below as evidence).

5. Claim 4 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Zhang et al. U.S. 6,122,533 in view of Ye U.S. 5,922,650 as applied to claim 1 above, and further in view of Nishikawa et al. U.S. 4,721,931.

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The Zhang/Ye combination discloses the invention as discussed above, except for disclosing it on a flat substrate rather than a cylinder.

Nishikawa et al. discloses that it is known to form strip conductor line resonator filters on cylindrical substrates to reduce the size of the filters (see e.g. the abstract, lines 8-9).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the conductor line resonator/filter of the Zhang/Ye combination by having substituted a cylindrical substrate in place of the planar substrate, because such an obvious modification would have provided the advantageous benefits of reduced size and electromagnetic shielding if the resonators were placed inside the cylinder with a ground plane on the outside thereof, as explicitly suggested by Nishikawa et al. (see e.g. the abstract, lines 8-12).

Allowable Subject Matter

6. Claims 2, 6, 7, 9 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sagawa et al. U.S. 5,055,809 discloses and provides evidence that it is known in the strip transmission line resonator art to form split-"ring" resonators with alternative

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resonator shapes (see Fig. 1 vs. Fig. 2 vs. Fig. 6) and discloses forming a capacitive part of the resonator by overlapping the ends 11 of the resonator "in a width direction" (see Fig. 1A) or by means of an interdigital overlap (see Fig. 1B).

Shibata et al. U.S. 4,641,116 also discloses and provides evidence that it is known in the strip transmission line resonator art to form split-"ring" resonators as ovals or squares or circles as art recognized equivalent resonator shapes (see Figs. 4-6).

Hidaka et al. U.S. 6,538,527 and U.S. 6,624,727 and U.S. 6,633,207 and U.S. 6,486,754; and Ota et al. U.S. 6,509,810 appear to be U.S. equivalents of the Japanese documents cited by Applicants.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barbara Summons whose telephone number is (571) 272-1771. The examiner can normally be reached on M-Th, M-Fr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bob Pascal can be reached on (571) 271-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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October 4, 2004



BARBARA SUMMONS
PRIMARY EXAMINER